

WHAT IS CLAIMED IS:

1. A disc head slider, comprising:  
a slider body having a bearing surface, a cavity dam and a sub-ambient pressure cavity, the sub-ambient pressure cavity having a cavity floor, a plurality of sides and a depth that progressively varies between a point on one of the sides and a corresponding point on an opposing side, and wherein the cavity floor comprises a plurality of substantially flat bottom surfaces separated by at least one elevational change.
2. The disc head slider of claim 1, wherein:  
the slider body further comprises a surface that includes an inside edge and an outside edge;  
an inside rail is disposed on and extends from the surface proximate the inside edge and forms a first portion of the bearing surface; and  
an outside rail is disposed on and extends from the surface proximate the outside edge and forms a second portion of the bearing surface.
3. The disc head slider of claim 1, wherein the sub-ambient pressure cavity further comprises a longitudinal axis and the plurality of bottom surfaces comprises:  
a first bottom surface positioned substantially on one side of the longitudinal axis; and

a second bottom surface positioned substantially on the other side of the longitudinal axis, the depth of the first bottom surface being different than the depth of the second bottom surface.

4. The disc head slider of claim 1, wherein the sub-ambient pressure cavity further comprises a transversal axis and the plurality of bottom surfaces comprises:

a first bottom surface positioned substantially on one side of the transversal axis; and  
a second bottom surface positioned substantially on the other side of the transversal axis, the depth of the first bottom surface being different than the depth of the second bottom surface.

5. The disc head slider of claim 1, wherein the sub-ambient pressure cavity further comprises a transversal axis, a longitudinal axis, a front side and a rear side, and wherein the plurality of bottom surfaces comprises:

a plurality of transversally extending bottom surfaces disposed between the front side and the rear side of the sub-ambient pressure cavity, wherein the bottom surface with a shallowest depth is positioned closest to the front side and the bottom surface with a deepest depth is positioned closest to the rear side.

6. The disc head slider of claim 1, wherein the sub-ambient pressure cavity further comprises a transversal axis, a longitudinal axis, a front side and a rear side, and wherein the plurality of bottom surfaces comprises:

a plurality of transversally extending bottom surfaces disposed between the front side and the rear side of the sub-ambient pressure cavity, wherein the bottom surface with a shallowest depth is positioned closest to the rear side and the bottom surface with a deepest depth is positioned closest to the front side.

7. The disc head slider of claim 1, wherein the sub-ambient pressure cavity further comprises a transversal axis, a longitudinal axis, an inside side and an outside side, and wherein the plurality of bottom surfaces comprises:

a plurality of longitudinally extending bottom surfaces disposed between the inside side and the outside side of the sub-ambient pressure cavity, wherein the bottom surface with a shallowest depth is positioned closest to the inside side and the bottom surface with a deepest depth is positioned closest to the outside side.

8. The disc head slider of claim 1, wherein the sub-ambient pressure cavity further comprises a transversal axis, a longitudinal axis, an inside side and an outside side, and wherein the plurality of bottom surfaces comprises:

a plurality of longitudinally extending bottom surfaces disposed between the inside side and the outside side of the sub-ambient pressure cavity, wherein the bottom surface with a shallowest depth is positioned closest to the outside side and the bottom surface with a deepest depth is positioned closest to the inside side.

9. The disc head slider of claim 1, wherein the plurality of bottom surfaces comprises four bottom surfaces that are each positioned at different depths from one another.
10. The disc head slider of claim 1, wherein:
  - the sub-ambient pressure cavity further comprises a longitudinal axis;
  - the plurality of bottom surfaces comprises a total of four bottom surfaces; and
  - two bottom surfaces are positioned substantially on a first side of the longitudinal axis and two bottom surfaces are positioned substantially on a second side of the longitudinal axis.
11. The disc head slider of claim 10, wherein:
  - the sub-ambient pressure cavity further comprises a transversal axis; and

two bottom surfaces are positioned substantially on a first side of the transversal axis and two bottom surfaces are positioned substantially on a second side of the transversal axis.

12. The disc head slider of claim 11, wherein each of the bottom surfaces are positioned at different depths from one another.

13. The disc head slider of claim 11, wherein:  
the two bottom surfaces on the first side of the longitudinal axis are positioned at different depths from one another;  
the two bottom surfaces on the second side of the longitudinal axis are positioned at different depths from one another;  
the two bottom surfaces on the first side of the transversal axis are positioned at different depths from one another;  
the two bottom surfaces on the second side of the transversal axis are positioned at different depths from one another; and  
wherein at least two of the four bottom surfaces have the same depth.

14. A disc head slider, comprising:  
a slider body having a bearing surface, a cavity dam and a sub-ambient pressure cavity, the sub-ambient pressure cavity having a cavity floor that includes at least three different depths, and wherein the cavity floor comprising a plurality of substantially flat bottom surfaces separated by at least one elevational change.

15. The disc head slider of claim 14, wherein:  
the slider body further comprises a surface that includes an inside edge and an outside edge;  
an inside rail is disposed on and extends from the surface proximate the inside edge and forms a first portion of the bearing surface; and  
an outside rail is disposed on and extends from the surface proximate the outside edge and forms a second portion of the bearing surface.
16. A disc head slider, comprising:  
a slider body having a bearing surface, a cavity dam and a sub-ambient pressure cavity, the sub-ambient pressure cavity having a cavity floor, a longitudinal axis and a plurality of sides, the sub-ambient pressure cavity also having a depth that progressively varies between a first point on one of the sides and a corresponding second point on an opposing side, and wherein the cavity floor comprises a tapered bottom surface having a line of maximum slope that is offset at an angle from the longitudinal axis.
17. The disc head slider of claim 16, wherein:  
the slider body further comprises a surface that includes an inside edge and an outside edge;

an inside rail is disposed on and extends from the surface proximate the inside edge and forms a first portion of the bearing surface; and  
an outside rail is disposed on and extends from the surface proximate the outside edge and forms a second portion of the bearing surface.

18. The disc head slider of claim 17, wherein:  
the sub-ambient pressure cavity further comprises an inside side and an outside side;  
the first point is on the inside side and the second point is on the outside side; and  
the line of maximum slope is approximately perpendicularly situated relative the longitudinal axis.
19. The disc head slider of claim 18, wherein:  
the inside side of the sub-ambient pressure cavity corresponds to and is on a same side of the slider body as the inside edge of the slider body;  
the outside side of the sub-ambient pressure cavity corresponds to and is on a same side of the slider body as the outside edge of the slider body;  
the depth of the sub-ambient pressure cavity is at a shallowest value proximate the inside side of the sub-ambient pressure cavity; and

the depth of the sub-ambient pressure cavity is at a deepest value proximate the outside side of the sub-ambient pressure cavity.

20. The disc head slider of claim 18, wherein:
- the inside side of the sub-ambient pressure cavity corresponds to and is on a same side of the slider body as the inside edge of the slider body;
  - the outside side of the sub-ambient pressure cavity corresponds to and is on a same side of the slider body as the outside edge of the slider body;
  - the depth of the sub-ambient pressure cavity is at a shallowest value proximate the outside side of the sub-ambient pressure cavity; and
  - the depth of the sub-ambient pressure cavity is at a deepest value proximate the inside side of the sub-ambient pressure cavity.
21. The disc head slider of claim 17, wherein:
- the line of maximum slope is offset at an angle of approximately 45° from the longitudinal axis.
22. The disc head slider of claim 21, wherein:
- the sub-ambient pressure cavity includes a front side and a rear side;



the front side of the sub-ambient pressure cavity corresponds to  
and is on a same side of the slider body as a leading edge of  
the slider body;

the rear side of the sub-ambient pressure cavity corresponds to  
and is on a same side of the slider body as a trailing edge of  
the slider body; and

the depth of the sub-ambient pressure cavity is generally more  
shallow proximate the front side of the sub-ambient  
pressure cavity and more deep proximate the rear side of  
the sub-ambient pressure cavity.

23. The disc head slider of claim 21, wherein:  
the sub-ambient pressure cavity includes a front side and a rear  
side;  
the front side of the sub-ambient pressure cavity corresponds to  
and is on a same side of the slider body as a leading edge of  
the slider body;  
the rear side of the sub-ambient pressure cavity corresponds to  
and is on a same side of the slider body as a trailing edge of  
the slider body; and  
the depth of the sub-ambient pressure cavity is generally more  
shallow proximate the rear side of the sub-ambient  
pressure cavity and more deep proximate the front side of  
the sub-ambient pressure cavity.

24. A disc head slider, comprising:

a slider body having a bearing-surface, a cavity dam and a sub-ambient pressure cavity, the sub-ambient pressure cavity having a plurality of sides, a cavity floor and a first depth; and

a protruding pattern disposed on the cavity floor and positioned so as to be disassociated from the plurality of sides, the protruding pattern having a second depth that is less than the first depth.

25. The disc head slider of claim 24, wherein the protruding pattern is positioned on the cavity floor so as to be generally located proximate an outside side of the sub-ambient pressure cavity.
26. The disc head slider of claim 24, wherein the protruding pattern is positioned on the cavity floor so as to be generally located proximate an inside side of the sub-ambient pressure cavity.
27. The disc head slider of claim 24, wherein the protruding pattern is positioned on the cavity floor so as to be generally located proximate a leading side of the sub-ambient pressure cavity.
28. The disc head slider of claim 24, wherein the protruding pattern is positioned on the cavity floor so as to be generally located

proximate a trailing side of the sub-ambient pressure cavity.

29. The disc head slider of claim 24, wherein the protruding pattern is positioned on the cavity floor so as to be generally centered relative the plurality of sides.
30. The disc head slider of claim 24, wherein the protruding pattern has a width of at least 2.5 microns.
31. The disc head slider of claim 24, wherein the protruding pattern comprises a cross-like shape.
32. The disc head slider of claim 24, wherein the second depth is less than the first depth, but greater than a depth associated with a plane that is even with at least one air-bearing rail associated with the disc head slider.
33. The disc head slider of claim 24, wherein the protruding pattern comprises a plurality of individual shapes that each have a second depth that is less than the first depth.
34. The disc head slider of claim 24, further comprising a lubricating material disposed on a portion of the protruding pattern.
35. A disc head slider, comprising:

a slider body having a bearing-surface, a cavity dam and a sub-ambient pressure cavity, the sub-ambient pressure cavity having a plurality of sides, a cavity floor and a first depth; and

a recessed pattern disposed on the cavity floor and positioned so as to be disassociated from the plurality of sides, the recessed pattern having a bottom surface and a second depth, the second depth being greater than the first depth and sufficient to affect a pressure characteristic associated with the sub-ambient pressure cavity during operational motion of the disc head slider.

36. The disc head slider of claim 35, wherein the recessed pattern is positioned on the cavity floor so as to be generally located proximate an outside side of the sub-ambient pressure cavity.
37. The disc head slider of claim 35, wherein the recessed pattern is positioned on the cavity floor so as to be generally located proximate an inside side of the sub-ambient pressure cavity.
38. The disc head slider of claim 35, wherein the recessed pattern is positioned on the cavity floor so as to be generally located proximate a leading side of the sub-ambient pressure cavity.

39. The disc head slider of claim 35, wherein the recessed pattern is positioned on the cavity floor so as to be generally located proximate a trailing side of the sub-ambient pressure cavity.
40. The disc head slider of claim 35, wherein the recessed pattern is positioned on the cavity floor so as to be generally centered relative the plurality of sides.
41. The disc head slider of claim 35, wherein the recessed pattern has a width of at least 2.5 microns.
42. The disc head slider of claim 35, wherein the recessed pattern comprises a cross-like shape.
43. The disc head slider of claim 35, wherein the second depth is at least 2 microns.
44. The disc head slider of claim 35, wherein the recessed pattern comprises a plurality of individual shapes that each have a second depth that is greater than the first depth.
45. A disc drive comprising:  
a disc rotatable about a central axis and having a recording surface; and

-50-

disc head slider means for carrying a transducer at a fly height  
relative to the recording surface during rotation of the disc  
and for affecting a characteristic of sub-ambient pressure  
formed within a sub-ambient pressure cavity during  
rotation of the disc.